

WHAT IS CLAIMED IS:

1. A light-emitting device comprising a reflective element, an emissive layer, a phase plate, and a polarizer in this order, wherein

polarization separators are provided between said emissive layer and said phase plate,

in light of a wavelength range which includes a part or all of a light-emission wavelength range of said emissive layer and is narrower than a visible wavelength range and is directed from said emissive layer side to said polarization separators side,

said polarization separators reflect circularly polarized light components which are converted into linearly polarized light that is absorbed by said polarizer due to an operation of said phase plate and transmit the other light, and

said reflective element is a reflecting surface for reflecting at least the circularly polarized light which was perpendicularly incoming as a circularly polarized light whose rotating direction is opposite.

2. A device according to claim 1, wherein said polarization separators are cholesteric liquid crystal layers and said phase plate is a quarter-wave plate.

3. A light-emitting device comprising a reflective element, an emissive layer, a phase plate, and a polarizer in this order, wherein

polarization separators are provided between

said phase plate and said polarizer,

in light of a wavelength range which includes a part or all of a light-emission wavelength range of said emissive layer and is narrower than a visible wavelength range and is directed from said emissive layer side to said polarization separators side,

said polarization separators reflect linearly polarized light components which are absorbed by said polarizer and transmit the other light,

said phase plate is a quarter-wave plate, and

said reflective element is a reflecting surface for reflecting at least the circularly polarized light which was perpendicularly incoming as a circularly polarized light whose rotating direction is opposite.

4. A device according to claim 1, wherein said emissive layer is organic thin films sandwiched by an optically transparent electrode and a metal electrode, and said metal electrode is a reflective electrode also serving as said reflective element.

5. A light-emitting display comprising: a plurality of light-emitting devices arranged in a matrix-form; and control means for controlling light-emitting operations of said light-emitting devices on the basis of image information, wherein

the light-emitting devices according to claim 1 or 3 are used as said light-emitting devices.

6. A light-emitting display having a light-

emitting device constructing a plurality of pixels arranged in a matrix-form and control means for controlling a light-emitting operation of said light-emitting device on the basis of image information, wherein

said light-emitting device comprises in order: organic electroluminescence devices of a structure obtained by depositing a metal electrode also serving as a reflective element, an emissive layer made of an organic thin film, and an optically transparent electrode; a phase plate; and a polarizer,

polarization separators are provided between said emissive layer and said phase plate,

in light of a wavelength range which includes a part or all of a light-emission wavelength range of said emissive layer and is narrower than a visible wavelength range and is directed from said emissive layer side to said polarization separators side,

said polarization separators reflect circularly polarized light components which are converted into linearly polarized light that is absorbed by said polarizer due to an operation of said phase plate and transmit the other light, and

said reflective element is a reflecting surface for reflecting at least the circularly polarized light which was perpendicularly incoming as a circularly polarized light whose rotating direction is opposite.

7. A display according to claim 6, wherein said polarization separators are cholesteric liquid crystal layers and said phase plate is a quarter-wave plate.
8. A display according to claim 6, wherein a light-emission color of said emissive layer differs in dependence on the pixel, and a reflective wavelength of said polarization separators differs in dependence on the pixel in correspondence to said light-emission color.
9. A display according to claim 6, wherein said emissive layer constructing said plurality of pixels executes a color display constructed by one of an emissive layer of a red light emission, an emissive layer of a green light emission, and an emissive layer of a blue light emission, a polarization separator for reflecting red light is pattern-formed at a position corresponding to said emissive layer of the red light emission, a polarization separator for reflecting green light is pattern-formed at a position corresponding to said emissive layer of the green light emission, and a polarization separator for reflecting blue light is pattern-formed at a position corresponding to said emissive layer of the blue light emission, respectively.
10. A display according to claim 6, wherein said polarization separators are pattern-formed in a matrix-form in correspondence to light-emitting regions of said emissive layer constructing said pixels, and a

black matrix is formed between the patterns of said polarization separators.

11. A display according to claim 10, wherein an aperture of said black matrix is wider than the light-emitting regions of said emissive layer constructing said pixels.

12. A device or a display according to claim 1 or 6, wherein the light-emission wavelength range of said emissive layer almost coincides with the reflective wavelength of said polarization separators at the position corresponding to said emissive layer.

13. A device or a display according to claim 1 or 6, wherein a half value width of a light-emission wavelength said emissive layer and a half value width of said reflective wavelength of said polarization separators corresponding to it are equal to or less than 75 nm.

14. A device or a display according to claim 1 or 6, wherein a center wavelength of the light emission of said emissive layer or a wavelength (peak wavelength) at which a maximum intensity is obtained almost coincides with a center wavelength of the reflection of said polarization separators at the position corresponding to said emissive layer.

15. A device or a display according to claim 1 or 6, wherein the reflective wavelength of said polarization separators at the position corresponding to a light-emitting region of said emissive layer is

narrower than a light-emitting wavelength range of said emissive layer.

16. A device or a display according to claim 1 or 6, wherein a center wavelength of the reflection of a polarization separator which is formed at a position corresponding to an emissive layer of a red light emission and reflects red light is set to be longer than a center wavelength of the light emission of said emissive layer or a wavelength (peak wavelength) indicative of a maximum intensity, thereby allowing the light-emission wavelength range of said emissive layer and a reflective wavelength of said polarization separator to almost coincide with each other in a visible wavelength range or setting the reflective wavelength of said polarization separator to be narrower than the light-emission wavelength range of said emissive layer in a visible wavelength range.

17. A device or a display according to claim 1 or 6, wherein an organic electroluminescence device is formed on a first substrate, the polarization separators are formed on a transparent second substrate different from said first substrate, a forming surface of the first substrate where said organic electroluminescence device has been formed and a forming surface of said second substrate where said polarization separators have been formed are overlaid and fixed.

18. A device or a display according to claim 1 or

6, wherein no substrate exists between said emissive layer and said polarization separators.

19. A device or a display according to claim 4 or 6, wherein a transparent insulation layer is provided between an optically transparent electrode and said polarization separators.

20. A device or a display according to claim 1 or 6, wherein a partition obtained by dispersing a pigment having a light absorbing property is provided into a non-light-emitting portion of said emissive layer.

21. A display according to claim 6, wherein said emissive layer constructing said pixels is an emissive layer for emitting white light, a polarization separator for reflecting red light, a polarization separator for reflecting green light, and a polarization separator for reflecting blue light are pattern-formed at positions corresponding to light-emitting regions of the emissive layer constructing said pixels, further, a color filter for transmitting red light is pattern-formed at positions corresponding to said polarization separator for reflecting the red light, a color filter for transmitting green light is pattern-formed at positions corresponding to said polarization separator for reflecting the green light, and a color filter for transmitting blue light is pattern-formed at positions corresponding to said polarization separator for reflecting the blue light, respectively.

2025-03-04 10:00:00